

DEPARTMENT OF COMMERCE.

BUREAU OF STANDARDS.

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UNITED STATES GOVERNMENT SPECIFICATION FOR
WOOD SCREWS.

FEDERAL SPECIFICATIONS BOARD.

STANDARD SPECIFICATION NO. 52.

This Specification was officially adopted by the Federal Specification Board, on February 1, 1923, for the use of the Departments and Independent Establishments of the Government in the purchase of wood screws.

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1. INTRODUCTION.

This specification summarizes the results of the standardization of wood screws by the manufacturers in cooperation with the Bureau of Standards and the technical committee on builders' hardware of the Federal Specifications Board. It has been officially adopted by the Federal Specifications Board for the use of all Departments and Independent Establishments of the Government in the purchase of wood screws.

The former difference of 0.013165 inch in diameter, used as a basis for the arithmetical progression of the numbering system,

has been discarded in favor of a difference of 0.013 inch (even) as established by the National Screw Thread Commission for machine screws. This provides interchangeability for the numbered sizes of machine screws and wood screws, in connection with articles that may be fastened either to metal or wood.

Flat, round, and oval head types are covered in the specification.

The numbered sizes of wood screws run consecutively from No. 0 (0.060 inch, or 1.5 mm) to No. 24 (0.372 inch, or 9.4 mm), omitting Nos. 13, 15, 17, 19, 21, 22, and 23.

The diameter is measured on the body of the screw under the head. The maximum tolerance in diameter permitted is +0.004 and -0.007 inch, or +0.1 and -0.2 mm.

The length of all screws is measured from the largest diameter of bearing surface of the head to the extreme end of the point measured parallel to axis of screw.

The plus tolerance in length is always zero. Tables of minus tolerance in length are given.

Screws are to be threaded approximately two-thirds of the nominal length.

The included angle of the head on flat and oval head screws is 82°.

The number of sizes of brass and steel screws manufactured as standard have been reduced from 555 to 291, a reduction of 47 per cent.

2. GENERAL SPECIFICATIONS.

MATERIAL AND WORKMANSHIP.—Screws shall be made of steel or brass, as specified, and shall be free from any defects which would affect their serviceability.

POINTS.—Standard screws shall be furnished with gimlet points. Cone and diamond pointed screws are special.

TYPES.—Screws shall be furnished in flat, round, or oval heads as ordered.

MEASUREMENT OF LENGTHS.—The length of all screws shall be measured from the largest diameter of bearing surface of the head to the extreme end of the point measured parallel to the axis of the screw.

THREADED LENGTH.—Screws shall be threaded approximately two-thirds of the nominal length.

MEASUREMENT OF DIAMETERS.—The diameter shall be measured on the body of the screw under the head.

TOLERANCE IN DIAMETER.—The maximum tolerance in diameter permitted is $+0.004$ and -0.007 inch, or $+0.1$ and -0.2 mm.

INCLUDED ANGLE.—The included angle of the head on flat and oval head screws shall be 82° .

3. DIAMETERS AND NUMBERS.

The following numbers, diameters, and threads per inch are standard:

Number of screw.	Diameter. ¹		Threads per inch. ²	Number of screw.	Diameter. ¹		Threads per inch. ²
	Inch.	Milli-meters.			Inch.	Milli-meters.	
0.....	0.060	1.5	32	9.....	0.177	4.5	14
1.....	.073	1.9	28	10.....	.190	4.8	13
2.....	.086	2.2	26	11.....	.203	5.2	12
3.....	.099	2.5	24	12.....	.216	5.5	11
4.....	.112	2.8	22	14.....	.242	6.1	10
5.....	.125	3.2	20	16.....	.268	6.8	9
6.....	.138	3.5	18	18.....	.294	7.5	8
7.....	.151	3.8	16	20.....	.320	8.1	8
8.....	.164	4.2	15	24.....	.372	9.4	7

¹ Tolerance in diameter= $+0.004$ inch, or $+0.1$ mm.

² Tolerance in number of threads per inch= ± 10 per cent.

4. TOLERANCE IN LENGTH.

FLAT AND OVAL HEAD SCREWS.—The maximum tolerances permitted in the length of flat and oval head screws are as follows:

[Plus tolerance=0.]

Nominal length.	Minus tolerance.	Nominal length.	Minus tolerance.
Inches.	Inch.	Inches.	Inch.
$\frac{1}{4}$	0.031	2	0.060
$\frac{3}{8}$	.033	$2\frac{1}{4}$	.064
$\frac{1}{2}$	.035	$2\frac{1}{2}$	.068
$\frac{5}{8}$	.037	$2\frac{3}{4}$	.072
$\frac{3}{4}$	.039	3	.076
$\frac{7}{8}$	.041	$3\frac{1}{2}$	.084
1	.043	4	.092
$1\frac{1}{4}$	.048	$4\frac{1}{2}$	.101
$1\frac{1}{2}$	.052	5	.109
$1\frac{3}{4}$	.056		

ROUND HEAD SCREWS.—The maximum tolerances permitted in the length of round head screws are as follows:

[Plus tolerance=0. Minus tolerances as given in body of table.]

Nominal length, inches.	Numbers.								
	0	1	2	3	4	5	6	7	8
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
$\frac{1}{4}$	0.064	0.071	0.077	0.084	0.090				
$\frac{3}{8}$	.065	.073	.079	.086	.092	0.099	0.105	0.112	0.118
$\frac{1}{2}$		.075	.081	.088	.094	.101	.107	.114	.120
$\frac{5}{8}$			.083	.090	.096	.103	.109	.116	.122
$\frac{3}{4}$			.085	.092	.098	.105	.111	.118	.124
$\frac{7}{8}$				.094	.100	.107	.113	.120	.126
1.....				.096	.102	.109	.115	.122	.128
$1\frac{1}{4}$					.106	.113	.119	.126	.132
$1\frac{1}{2}$					.110	.117	.123	.130	.136
$1\frac{3}{4}$							.127	.134	.140
2.....							.131	.138	.144
$2\frac{1}{4}$							.135	.142	.148
$2\frac{1}{2}$							.139	.146	.152

Nominal length, inches.	Numbers.								
	9	10	11	12	14	16	18	20	24
	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.	Inch.
$\frac{1}{2}$	0.127	0.133							
$\frac{3}{8}$	.129	.135	0.142	0.148					
$\frac{1}{4}$	.131	.137	.144	.150	0.163				
$\frac{7}{8}$	.133	.139	.146	.152	.165				
1.....	.135	.141	.148	.154	.167	0.180			
$1\frac{1}{4}$	.139	.145	.152	.158	.171	.184	0.198		
$1\frac{1}{2}$	.143	.149	.156	.162	.175	.188	.202	0.215	
$1\frac{3}{4}$	.147	.153	.160	.166	.179	.192	.206	.219	
2.....	.151	.157	.164	.170	.183	.196	.210	.223	
$2\frac{1}{4}$	.155	.161	.168	.174	.187	.200	.214	.227	
$2\frac{1}{2}$	.159	.165	.172	.178	.191	.204	.218	.231	
$2\frac{3}{4}$	.163	.169	.176	.182	.195	.208	.222	.235	
3.....	.167	.173	.180	.186	.199	.212	.226	.239	0.265
$3\frac{1}{2}$		.181	.188	.194	.207	.220	.234	.247	.273
4.....				.202	.215	.228	.242	.255	.281
$4\frac{1}{2}$					.223	.236	.250	.263	.289
5.....					.231	.244	.258	.271	.297

5. STANDARD SIZES, STEEL.

STEEL SCREWS.—The following sizes of steel screws are standard:

Lengths.		No. 0. Diam- eter, 0.060 in., 1.5 mm.	No. 1. Diam- eter, 0.073 in., 1.9 mm.	No. 2. Diam- eter, 0.086 in., 2.2 mm.	No. 3. Diam- eter, 0.099 in., 2.5 mm.	No. 4. Diam- eter, 0.112 in., 2.8 mm.	No. 5. Diam- eter, 0.125 in., 3.2 mm.	No. 6. Diam- eter, 0.138 in., 3.5 mm.	No. 7. Diam- eter, 0.151 in., 3.8 mm.	No. 8. Diam- eter, 0.164 in., 4.2 mm.
Inches.	Milli- meters.									
$\frac{1}{4}$	6.4	✓	✓	✓	✓	✓				
$\frac{3}{8}$	9.5	✓	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{1}{2}$	12.7	-----	✓	✓	✓	✓	✓	✓	✓	✓
$\frac{5}{8}$	15.9	-----	-----	✓	✓	✓	✓	✓	✓	✓
$\frac{3}{4}$	19.1	-----	-----	✓	✓	✓	✓	✓	✓	✓
$\frac{7}{8}$	22.2	-----	-----	-----	✓	✓	✓	✓	✓	✓
1	25.4	-----	-----	-----	✓	✓	✓	✓	✓	✓
$1\frac{1}{4}$	31.8	-----	-----	-----	-----	✓	✓	✓	✓	✓
$1\frac{1}{2}$	38.1	-----	-----	-----	-----	✓	✓	✓	✓	✓
$1\frac{3}{4}$	44.5	-----	-----	-----	-----	-----	✓	✓	✓	✓
2	50.8	-----	-----	-----	-----	-----	-----	✓	✓	✓
$2\frac{1}{4}$	57.2	-----	-----	-----	-----	-----	-----	✓	✓	✓
$2\frac{1}{2}$	63.5	-----	-----	-----	-----	-----	-----	✓	✓	✓
$2\frac{3}{4}$	69.9	-----	-----	-----	-----	-----	-----	-----	✓	✓
3	76.2	-----	-----	-----	-----	-----	-----	-----	-----	✓

Lengths.		No. 9. Diam- eter, 0.177 in., 4.5 mm.	No. 10. Diam- eter, 0.190 in., 4.8 mm.	No. 11. Diam- eter, 0.203 in., 5.2 mm.	No. 12. Diam- eter, 0.216 in., 5.5 mm.	No. 14. Diam- eter, 0.242 in., 6.1 mm.	No. 16. Diam- eter, 0.268 in., 6.8 mm.	No. 18. Diam- eter, 0.294 in., 7.5 mm.	No. 20. Diam- eter, 0.320 in., 8.1 mm.	No. 24. Diam- eter, 0.372 in., 9.4 mm.
Inches.	Milli- meters.									
$\frac{1}{2}$	12.7	✓	✓	-----	✓	-----	-----	-----	-----	-----
$\frac{3}{8}$	15.9	✓	✓	✓	✓	-----	-----	-----	-----	-----
$\frac{1}{4}$	19.1	✓	✓	✓	✓	✓	-----	-----	-----	-----
$\frac{3}{8}$	22.2	✓	✓	✓	✓	✓	-----	-----	-----	-----
$\frac{1}{2}$	25.4	✓	✓	✓	✓	✓	✓	-----	-----	-----
$1\frac{1}{4}$	31.8	✓	✓	✓	✓	✓	✓	✓	-----	-----
$1\frac{1}{2}$	38.1	✓	✓	✓	✓	✓	✓	✓	✓	-----
$1\frac{3}{4}$	44.5	✓	✓	✓	✓	✓	✓	✓	✓	-----
2	50.8	✓	✓	✓	✓	✓	✓	✓	✓	-----
$2\frac{1}{4}$	57.2	✓	✓	✓	✓	✓	✓	✓	✓	-----
$2\frac{1}{2}$	63.5	✓	✓	✓	✓	✓	✓	✓	✓	-----
$2\frac{3}{4}$	69.9	✓	✓	✓	✓	✓	✓	✓	✓	-----
3	76.2	✓	✓	✓	✓	✓	✓	✓	✓	✓
$3\frac{1}{2}$	88.9	-----	✓	✓	✓	✓	✓	✓	✓	✓
4	101.6	-----	-----	-----	✓	✓	✓	✓	✓	✓
$4\frac{1}{2}$	114.3	-----	-----	-----	-----	✓	✓	✓	✓	✓
5	127.0	-----	-----	-----	-----	✓	✓	✓	✓	✓

6. STANDARD SIZES, BRASS.

BRASS SCREWS.—The following sizes of brass screws are standard:

Lengths.		No. 0. Diam- eter, 0.060 in., 1.5 mm.	No. 1. Diam- eter, 0.073 in., 1.9 mm.	No. 2. Diam- eter, 0.086 in., 2.2 mm.	No. 3. Diam- eter, 0.099 in., 2.5 mm.	No. 4. Diam- eter, 0.112 in., 2.8 mm.	No. 5. Diam- eter, 0.125 in., 3.2 mm.	No. 6. Diam- eter, 0.138 in., 3.5 mm.	No. 7. Diam- eter, 0.151 in., 3.8 mm.
Inches.	Milli- meters.								
$\frac{1}{8}$	6.4	✓	✓	✓	✓	✓			
$\frac{3}{16}$	9.5	✓	✓	✓	✓	✓			
$\frac{1}{4}$	12.7		✓	✓	✓	✓	✓	✓	✓
$\frac{5}{16}$	15.9			✓	✓	✓	✓	✓	✓
$\frac{3}{8}$	19.1			✓	✓	✓	✓	✓	✓
$\frac{7}{8}$	22.2					✓	✓	✓	✓
1.....	25.4						✓	✓	✓
$1\frac{1}{4}$	31.8							✓	✓
$1\frac{1}{2}$	38.1							✓	✓

Lengths.		No. 8. Diam- eter, 0.164 in., 4.2 mm.	No. 9. Diam- eter, 0.177 in., 4.5 mm.	No. 10. Diam- eter, 0.190 in., 4.8 mm.	No. 11. Diam- eter, 0.203 in., 5.2 mm.	No. 12. Diam- eter, 0.216 in., 5.5 mm.	No. 14. Diam- eter, 0.242 in., 6.1 mm.	No. 16. Diam- eter, 0.268 in., 6.8 mm.	No. 18. Diam- eter, 0.294 in., 7.5 mm.
Inches.	Milli- meters.								
$\frac{1}{8}$	12.7	✓							
$\frac{3}{16}$	15.9	✓		✓					
$\frac{1}{4}$	19.1	✓	✓	✓					
$\frac{5}{16}$	22.2	✓	✓	✓	✓				
1.....	25.4	✓	✓	✓	✓	✓	✓		
$1\frac{1}{4}$	31.8	✓	✓	✓	✓	✓	✓		
$1\frac{1}{2}$	38.1	✓	✓	✓	✓	✓	✓		
$1\frac{3}{4}$	44.5	✓	✓	✓	✓	✓	✓		
2.....	50.8	✓	✓	✓	✓	✓	✓	✓	✓
$2\frac{1}{4}$	57.2			✓	✓	✓	✓	✓	✓
$2\frac{1}{2}$	63.5			✓	✓	✓	✓	✓	✓
3.....	76.2					✓	✓	✓	✓
$3\frac{1}{2}$	88.9					✓	✓	✓	✓

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